CLAIMS:

1. A method of utilizing an implantable medical device having at least three sensing leads, the method comprising:

sensing the number of electrical conductions traveling from the right atrium to the right ventricle;

sensing the number of electrical conductions traveling from the right atrium to the left ventricle;

sensing the number of electrical conductions traveling from the left atrium to the right ventricle;

sensing the number of electrical conductions traveling from the left atrium to the left ventricle;

recording as data the number of electrical conductions traveling from the right atrium to the right ventricle in a memory;

recording as data the number of electrical conductions traveling from the right atrium to the left ventricle in the memory;

recording as data the number of electrical conductions traveling from the left atrium to the right ventricle in the memory;

recording as data the number of electrical conductions traveling from the left atrium to the left ventricle in the memory; and

outputting the recorded data for analysis, wherein the data is indicative of a cardiac parameter.

2. The method of claim 1, wherein the outputted data is indicative of a total number of conductions along each A-V pathway.

3. The method of claim 1, further comprising:

determining if an incorrect conductive pathway exists based on the data that is output; and

adjusting the rate of ventricular pacing to reduce the occurrence of conductions along the incorrect pathway.

4. The method of claim 3, wherein determining and adjusting occur automatically within the implantable medical device.

5. A method of utilizing an implantable medical device having at least three sensing leads, the method comprising:

sensing the number of conductions traveling from the right atrium to the left atrium;

sensing the number of conductions traveling from the left atrium to the right atrium;

recording as data the number of electrical conductions traveling from the right atrium to left atrium;

recording as data the number of electrical conductions traveling from the left atrium to the right atrium; and

outputting the recorded data for analysis, wherein the data is indicative of a cardiac parameter.

6. The method of claim 5, further comprising:

measuring the timing of each conduction; and

recording the timing of each measured conduction in memory.

7. The method of claim 6, wherein recording the timing of each measured conduction further comprises:

incrementing a counter in one of a plurality of predetermined time ranges corresponding the measured time of the conduction.

8. The method of claim 5, further comprising:

determining in the left atrium is acting as a primary pacemaker, based on the data output; and

pacing the atrium at a higher rate in order to reestablish conduction from the right atrium to the left atrium.

9. The method of claim 8, wherein determining and pacing occur automatically within the implantable medical device.

10. A method of utilizing an implantable medical device having at least three sensing leads, the method comprising:

sensing the number of conductions traveling from the right ventricle to the left ventricle;

sensing the number of conductions traveling from the left ventricle to the right ventricle;

recording as data the number of electrical conductions traveling from the right ventricle to left ventricle;

recording as data the number of electrical conductions traveling from the left ventricle to the right ventricle; and

outputting the recorded data for analysis, wherein the data is indicative of a cardiac parameter.

11. The method of claim 10, further comprising:

measuring the timing of each conduction; and

recording the timing of each measured conduction in memory.

12. The method of claim 11, wherein recording the timing of each measured conduction further comprises:

incrementing a counter in one of a plurality of predetermined time ranges corresponding the measured time of the conduction.

13. The method of claim 10, wherein the conductions are initiated by pacing signals generated by the implantable medical device.

14. A method of utilizing an implantable medical device having at least three sensing leads, the method comprising:

sensing the timing of conductions traveling from a paced right ventricle to a sensed left ventricle;

sensing the timing of conductions traveling from a paced left ventricle to a sensed right ventricle;

recording the timing of the conductions traveling from a paced right ventricle to a sensed left ventricle;

recording the timing of the conductions traveling from a paced left ventricle to a sensed right ventricle; and

outputting the recorded data for analysis, wherein the data is indicative of a cardiac parameter.

15. The method of claim 10, further comprising:

determining if conduction time from the left ventricle are slower than, faster than or approximately equal to the conduction time from the right ventricle; and

pacing in a direction having the fastest conduction time.

16. The method of claim 15, wherein determining and pacing occur within the implantable medical device.

17. A method of utilizing an implantable medical device having at least three sensing leads, the method comprising:

sensing cardiac events;

recording data in a memory about the sensed cardiac events; and

outputting the recorded data for analysis, wherein the data is indicative of a supraventricular tachycardia.

18. The method of claim 17, wherein recording data includes recording whether the supra ventricular tachycardia was first sensed by a right atrial lead or first sensed by a left atrial lead.

19. The method of claim 18, wherein the outputted data is indicative of the number of sensed supra ventricular tachycardias initiated in the right atrium and the number of supra ventricular tachycardias initiated in the left atrium.

20. The method of claim 18, further comprising:

initiating antitachycardia pacing when the supraventricular tachycardia is detected.

21. The method of claim 20, wherein initiating antitachycardia pacing further comprises:

pacing in an atrial chamber where the supraventricular tachycardia originated in.

22. A method of utilizing an implantable medical device having at least three sensing leads, the method comprising:

sensing cardiac events;

recording data in a memory about the sensed cardiac events; and

outputting the recorded data for analysis, wherein the data is indicative of an atrial flutter.

23. The method of claim 22, wherein recording data includes recording whether the atrial flutter was first sensed by a right atrial lead or first sensed by a left atrial lead.

24. The method of claim 23, wherein the outputted data is indicative of the number of sensed atrial flutters initiated in the right atrium and the number of atrial flutters initiated in the left atrium.

25. The method of claim 24, further comprising:

initiating antitachycardia pacing when the atrial flutter is detected.

26. The method of claim 25, wherein initiating antitachycardia pacing further comprises;

pacing in an atrial chamber where the atrial flutter originated in.

27. The method of claim 24, further comprising:

initiating cardioversion when the atrial flutter is detected.

28. A method of utilizing an implantable medical device having at least three sensing leads, the method comprising:

sensing cardiac events;

recording data in a memory about the sensed cardiac events; and

outputting the recorded data for analysis, wherein the data is indicative of an atrial fibrillation.

29. The method of claim 28, wherein recording data includes recording whether the atrial fibrillation was first sensed by a right atrial lead or first sensed by a left atrial lead.

30. The method of claim 29 wherein the outputted data is indicative of the number of sensed atrial fibrillations initiated in the right atrium and the number of atrial fibrillations initiated in the left atrium.

31. The method of claim 28, further comprising:

initiating defibrillation when the atrial fibrillation is detected.

32. The method of claim 31, wherein defibrillation is initiated in the atrial chamber where the fibrillation originated in.

33. A method of utilizing an implantable medical device having at least three sensing leads, the method comprising:

sensing cardiac events;

recording data in a memory about the sensed cardiac events; and

outputting the recorded data for analysis, wherein the data is indicative of a premature ventricular contraction.

34. The method of claim 33 wherein recording data includes recording whether the premature ventricular contraction was first sensed by a right ventricular lead or first sensed by a left ventricular lead.

35. The method of claim 34, wherein the outputted data is indicative of the number of sensed premature ventricular contractions initiated in the right ventricle and the number of premature ventricular contractions initiated in the left ventricle.

36. The method of claim 34, further comprising:

initiating antitachycardia pacing when the premature ventricular contraction is detected.

37. The method of claim 36, wherein antitachycardia pacing is initiated in the chamber that the premature ventricular contraction originated in.

38. A method of utilizing an implantable medical device having at least three sensing leads, the method comprising:

sensing cardiac events;

recording data in a memory about the sensed cardiac events; and

outputting the recorded data for analysis, wherein the data is indicative of a ventricular tachycardia.

39. The method of claim 38, wherein recording data includes recording whether the ventricular tachycardia was first sensed by a right ventricular lead or first sensed by a left ventricular lead.

40. The method of claim 37, wherein the outputted data is indicative of the number of sensed ventricular tachycardias initiated in the right ventricle and the number of ventricular tachycardias initiated in the left ventricle.

41. The method of claim 38, further comprising:

initiating antitachycardia pacing when the ventricular tachycardia is detected.

42. The method of claim 41, wherein antitachycardia pacing is initiated in the chamber that the ventricular tachycardia originated in.

43. The method of claim 38, further comprising:

initiating cardioversion when the ventricular tachycardia is detected.

44. An implantable pacemaker system comprising:

a first lead for sensing cardiac events;

a second lead for sensing cardiac events;

a third lead for sensing cardiac events;

a controller for controlling the implantable medical device;

a memory for recording information relating to the cardiac events sensed, wherein the information is indicative of a number of conductions sensed between the first lead and the second lead; and

a data output mechanism for delivering the recorded information to an external device for viewing the data which is indicative of the direction and dominance of the sensed conductions between cardiac chambers.

45. The implantable pacemaker of claim 44, wherein the first lead is positioned in the right atrium and the second lead is positioned in the left atrium.

46. The implantable pacemaker of claim 44, wherein the first lead is positioned in the right ventricle and the second lead is positioned in the left ventricle.

47. The implantable pacemaker of claim 46, wherein the conductions sensed are initiated by pacing the first lead.

48. The implantable pacemaker of claim 46, wherein the conductions sensed are initiated by pacing the second lead.

49. The implantable pacemaker of claim 44, wherein the information is further indicative of the duration of each of the conductions.

50. The implantable pacemaker of claim 44, further comprising:

a fourth lead, implanted in the right atrium, wherein the first lead is implanted in the right ventricle, the second lead is implanted in the left ventricle and the third lead is implanted in the left atrium so that the number of conduction occurring from the fourth lead to the first lead, the number of conduction occurring from the fourth lead to the second lead, the number of conductions occurring from the third lead to the first lead and the number of conductions occurring from the third lead to the second lead are recorded.

51. The implantable pacemaker of claim 44, wherein the first lead is positioned in the right atrium and the second lead is positioned in the left atrium and the cardiac events sensed are supra ventricular tachycardias, wherein the recorded information includes an indication of the atrial chamber in which each sensed supra ventricular tachycardia originated.

52. The implantable pacemaker of claim 44, wherein the first lead is positioned in the right atrium and the second lead is positioned in the left atrium and the cardiac events sensed are atrial flutters, wherein the recorded information includes an indication of the atrial chamber in which each sensed atrial flutter originated.

53. The implantable pacemaker of claim 44, wherein the first lead is positioned in the right atrium and the second lead is positioned in the left atrium and the cardiac events sensed are atrial fibrillations, wherein the recorded information includes an indication of the atrial chamber in which each sensed atrial fibrillation originated.

54. The implantable pacemaker of claim 44, wherein the first lead is positioned in the right ventricle and the second lead is positioned in the left ventricle and the cardiac events sensed are premature ventricular contractions, wherein the recorded information includes an indication of the ventricular chamber in which each sensed premature ventricular contraction originated.

55. The implantable pacemaker of claim 44, wherein the first lead is positioned in the right ventricle and the second lead is positioned in the left ventricle and the cardiac events sensed are ventricular tachycardias, wherein the recorded information includes an indication of the ventricular chamber in which each sensed ventricular tachycardia originated.

56. A method of utilizing a biatrial biventricular pacing system to determine the distribution pattern of atrial to ventricular conduction sequences in a patient having a conductive disorder, the method comprising:

placing sensing leads in both atrial chambers and both ventricular chambers;

sensing conduction sequences occurring from one atrial chamber to one ventricular chamber;

determining which atrial chamber the conduction sequence originated in and which ventricular chamber it propagated to; and

recording the determined information in a memory such that the information can be used to identify the relative distribution of conduction sequences.

57. A method of utilizing a biatrial pacing system to determine the distribution of atrial to atrial conduction sequences in a patient having a conductive disorder, the method comprising:

placing sensing leads in both atrial chambers;

sensing conduction sequences occurring from one atrial chamber to another atrial chamber;

determining which atrial chamber the conduction sequence originated in and which atrial chamber it propagated to; and

recording the determined information in a memory such that the information can be used to identify the relative distribution of conduction sequences.

58. The method of claim 57, further comprising:

measuring the timing of each conductive sequence; and

including the measured timing information in the memory so that the information can also be utilized to identify relative timing information correlated to the distribution.

59. The method of claim 58, wherein each measured conductive sequence is caused to increment a counter representing one of a plurality of time ranges indicative of the timing of the conductive sequence.

60. A method of utilizing a biventricular pacing system to determine the distribution of ventricle to ventricle conduction sequences in a patient having a conductive disorder, the method comprising:

placing sensing leads in both ventricular chambers;

sensing conduction sequences occurring from one ventricular chamber to another ventricular chamber;

determining which ventricular chamber the conduction sequence originated in and which ventricular chamber it propagated to; and

recording the determined information in a memory such that the information can be used to identify the relative distribution of conduction sequences.

61. The method of claim 60, further comprising:

measuring the timing of each conductive sequence; and

including the measured timing information in the memory so that the information can also be utilized to identify relative timing information correlated to the distribution.

62. The method of claim 61, wherein each measured conductive sequence is caused to increment a counter representing one of a plurality of time ranges indicative of the timing of the conductive sequence.

63. The method of claim 61, further comprising:

pacing one ventricular chamber in order to generate a conductive sequence.

64. The method of claim 63 wherein each measured conductive sequence is caused to increment a counter representing one of a plurality of time ranges indicative of the timing of the paced conductive sequence.

65. A method of utilizing a biatrial pacing system to determine the predominant origin of supra ventricular tachycardias, in a patient having atrial arrhythmia, the method comprising:

placing sensing leads in both atrial chambers;

sensing conduction sequences;

determining if the sensed conduction sequence is a supra ventricular tachycardia;

determining which atrial chamber the supra ventricular tachycardia originated in; and

recording information related to the determination of which atrial chamber the supra ventricular tachycardia originated in, into a memory such that the information can be used to identify the predominant originating chamber of the supra ventricular tachycardia.

66. A method of utilizing a biatrial pacing system to determine the predominant origin of atrial flutter in a patient having atrial arrhythmia, the method comprising:

placing sensing g leads in both atrial chambers;

sensing conduction sequences;

determining if the sensed conduction sequence is an atrial flutter;

determining which atrial chamber the atrial flutter originated in; and

recording information related to the determination of which atrial chamber the atrial flutter originated in, into a memory such that the information can be used to identify the predominant originating chamber of the atrial flutter.

67. A method of utilizing a biatrial pacing system to determine the predominant origin of atrial fibrillation in a patient having atrial arrhythmia, the method comprising:

placing sensing leads in both atrial chambers;

sensing conduction sequences;

determining if the sensed conduction sequence is a atrial fibrillation; and

determining which atrial chamber the atrial fibrillation originated in;

recording information related to the determination of which atrial chamber the atrial fibrillation originated in, into a memory such that the information can be used to identify the predominant originating chamber of the atrial fibrillation.

68. A method of utilizing a biventricular pacing system to determine the predominant origin of premature ventricular contractions, in a patient having ventricular arrhythmia, the method comprising:

placing sensing leads in both ventricular chambers;

sensing conduction sequences;

determining if the sensed conduction sequence is premature ventricular contraction; determining which ventricular chamber the premature ventricular contraction originated in; and

recording information related to the determination of which ventricular chamber the premature ventricular contraction originated in, into a memory such that the information can be used to identify the predominant originating chamber of the premature ventricular contraction.

69. A method of utilizing a biventricular pacing system to determine the predominant origin of ventricular tachycardia, in a patient having ventricular arrhythmia, the method comprising:

placing sensing leads in both ventricular chambers;

sensing conduction sequences;

determining if the sensed conduction sequence is ventricular tachycardia;

determining which ventricular chamber the ventricular tachycardia originated in; and

recording information related to the determination of which ventricular chamber the ventricular tachycardia originated in, into a memory such that the information can be used to identify the predominant originating chamber of the ventricular tachycardia.

70. An implantable pacemaker system comprising:

means for sensing cardiac events in at least three of the cardiac chambers;

means for controlling the implantable medical device;

memory means for recording information relating to the cardiac events sensed, wherein the information is indicative of a number of conductions sensed between the means for sensing; and

data output means for delivering the recorded information to an external device for viewing the data which is indicative of the direction and dominance of the sensed conductions between cardiac chambers.

71. The implantable pacemaker of claim 70, wherein the sensed conductions are initiated by pacing means.

72. The implantable pacemaker of claim 70, wherein the information is further indicative of the duration of each of the conductions.

73. The implantable pacemaker of claim 70, wherein the means for sensing senses supra ventricular tachycardias, and wherein the recorded information includes an indication of the atrial chamber in which each sensed supra ventricular tachycardia originated.

74. The implantable pacemaker of claim 70, wherein the means for sensing senses atrial flutters, and wherein the recorded information includes an indication of the atrial chamber in which each sensed atrial flutter originated.

75. The implantable pacemaker of claim 70, wherein the means for sensing senses atrial fibrillations, and wherein the recorded information includes an indication of the atrial chamber in which each sensed atrial fibrillation originated.

76. The implantable pacemaker of claim 70, wherein the means for sensing senses premature ventricular contractions, and wherein the recorded information includes an indication of the ventricular chamber in which each sensed premature ventricular contraction originated.

77. The implantable pacemaker of claim 70, wherein the means for sensing senses ventricular tachycardias, and wherein the recorded information includes an indication of the ventricular chamber in which the sensed ventricular tachycardia originated.

78. A biatrial-biventricular pacing system including for determining the distribution pattern of atrial to ventricular conduction sequences in a patient having a conductive disorder, comprising:

sensing means, located in both atrial chambers and both ventricular chambers, wherein the sensing means sense conduction sequences occurring from one atrial chamber to one ventricular chamber;

means for determining which atrial chamber the conduction sequence originated in and which ventricular chamber it propagated to; and

means for recording the determined information in a memory such that the information can be used to identify the relative distribution of conduction sequences.

79. The biatrial-biventricular pacing system of claim 78, further comprising:

means for delivering therapy to restore conduction sequences to normal.

80. A biatrial pacing system for determining the distribution of atrial to atrial conduction sequences in a patient having a conductive disorder, comprising:

sensing means located in both atrial chambers for sensing conduction sequences occurring from one atrial chamber to another atrial chamber;

means for determining which atrial chamber the conduction sequence originated in and which atrial chamber it propagated to; and

means for recording the determined information in a memory such that the information can be used to identify the relative distribution of conduction sequences.

81. The biatrial pacing system of claim 80, further comprising:

means for measuring the timing of each conductive sequence and including the measured timing information in the memory so that the information can also be utilized to identify relative timing information correlated to the distribution.

82. The biatrial pacing system of claim 81 wherein each measured conductive sequence is caused to increment a counter representing one of a plurality of time ranges indicative of the timing of the conductive sequence.

83. The biatrial pacing system of claim 80, further comprising:

means for delivering antitachycardia pacing in response to the determined information.

84. A biventricular pacing system for determining the distribution of ventricle to ventricle conduction sequences in a patient having a conductive disorder, comprising:

sensing means located in both ventricular chambers for sensing conduction sequences occurring from one ventricular chamber to another ventricular chamber;

means for determining which ventricular chamber the conduction sequence originated in and which ventricular chamber it propagated to; and

means for recording the determined information in a memory such that the information can be used to identify the relative distribution of conduction sequences.

85. The biventricular pacing system of claim 84, further comprising:

means for measuring the timing of each conductive sequence and including the measured timing information in the memory so that the information can also be utilized to identify relative timing information correlated to the distribution.

86. The biventricular pacing system of claim 85, wherein each measured conductive sequence is caused to increment a counter representing one of a plurality of time ranges indicative of the timing of the conductive sequence.

87. The biventricular pacing system of claim 85, further comprising:

means for pacing one ventricular chamber in order to generate a conductive sequence.

88. The biventricular pacing system of claim 87, wherein each measured conductive sequence is caused to increment a counter representing one of a plurality of time ranges indicative of the timing of the paced conductive sequence.

89. The biventricular pacing system of claim 84, further comprising:

means for delivering antitachycardia pacing in response to the determined information.

90. A biatrial pacing system for determining the predominant origin of supra ventricular tachycardias, in a patient having atrial arrhythmia, comprising:

sensing means in both atrial chambers for sensing conduction sequences;

means for determining if the sensed conduction sequence is a supra ventricular tachycardia;

means for determining which atrial chamber the supra ventricular tachycardia originated in; and

means for recording information related to the determination of which atrial chamber the supra ventricular tachycardia originated in, into a memory such that the information can be used to identify the predominant originating chamber of the supra ventricular tachycardia.

91. The biatrial pacing system of claim 90, further comprising:

means for delivering antitachycardia pacing in response to the determined information.

92. The biatrial pacing system of claim 91, wherein the means for delivering antitachycardia pacing deliver therapy to the atrial chamber that the supra ventricular tachycardia originated in.

93. A biatrial pacing system for determining the predominant origin of atrial flutter, in a patient having atrial arrhythmia, comprising:

sensing means in both atrial chambers for sensing conduction sequences;

means for determining if the sensed conduction sequence is an atrial flutter;

means for determining which atrial chamber the atrial flutter originated in; and

means for recording information related to the determination of which atrial chamber the atrial flutter originated in, into a memory such that the information can be used to identify the predominant originating chamber of the atrial flutter.

94. The biatrial pacing system of claim 93, further comprising:

means for delivering antitachycardia pacing in response to the determined information.

95. The biatrial pacing system of claim 94, wherein the means for delivering antitachycardia pacing deliver therapy to the atrial chamber that the atrial flutter originated in.

96. The biatrial pacing system of claim 93, further comprising:

means for delivering cardioversion in response to the determined information.

97. A biatrial pacing system for determining the predominant origin of atrial fibrillation, in a patient having atrial arrhythmia, comprising:

sensing means in both atrial chambers for sensing conduction sequences;

means for determining if the sensed conduction sequence is a atrial fibrillation;

means for determining which atrial chamber the atrial fibrillation originated in; and

means for recording information related to the determination of which atrial chamber the atrial fibrillation originated in, into a memory such that the information can be used to identify the predominant originating chamber of the atrial fibrillation.

98. The biatrial pacing system of claim 97, further comprising:

means for delivering defibrillation in response to the determined information.

99. The biatrial pacing system of claim 98, wherein the means for delivering defibrillation delivers therapy to the atrial chamber that the atrial fibrillation originated in.

100. A biventricular pacing system for determining the predominant origin of premature ventricular contractions, in a patient having ventricular arrhythmia, comprising:

means for sensing in both ventricular chambers for sensing conduction sequences;

means for determining if the sensed conduction sequence is premature ventricular contraction;

means for determining which ventricular chamber the premature ventricular contraction originated in; and

means for recording information related to the determination of which ventricular chamber the premature ventricular contraction originated in, into a memory such that the information can be used to identify the predominant originating chamber of the premature ventricular contraction.

101. A biventricular pacing system for determining the predominant origin of ventricular tachycardia, in a patient having ventricular arrhythmia, comprising:

sensing means in both ventricular chambers for sensing conduction sequences;

means for determining if the sensed conduction sequence is ventricular tachycardia;

means for determining which ventricular chamber the ventricular tachycardia originated in; and

means recording information related to the determination of which ventricular chamber the ventricular tachycardia originated in, into a memory such that the information can be used to identify the predominant originating chamber of the ventricular tachycardia.

102. The biventricular pacing system of claim 101, further comprising:

means for delivering antitachycardia pacing in response to the determined information.

103. The biatrial pacing system of claim 102, wherein the means for delivering antitachycardia pacing deliver therapy to the ventricular chamber that the ventricular tachycardia originated in.

104. The biventricular pacing system of claim 101, further comprising:

means for delivering cardioversion in response to the determined information.